

ABSTRACT

A system and process for thermolytic eradication of bacteria and biofilm in the root canal of a human tooth involve an elongated and flexible optical probe and a laser oscillator that provides the probe with low infrared energy. The optical probe is sufficiently long for insertion into substantially the entire length of the root canal of the tooth. The optical probe causes lateral dispersion of the radiation from the probe throughout the root canal. The radiation is provided at an energy density and for a period of time that are necessary to selectively target bacteria and live biofilm in the dentinal tubules of an entire root canal system, at once, thereby (1) inhibiting creation of a blackbody "hot tip", and (2) inducing laser interstitial thermotherapy (LITT) within the root-canal space.